SCIENCE OR POETRY.

EDITOR OF SCIENCE: In your issue of October 4th, p. 437, under the title, 'Science or Poetry" there is discussed the soundness of the scientific views of three Americans. Referring to one he quotes from his address in SCIENCE, August 23, p. 210, "It can be stated without fear of refutation that every physiological investigation shows with accumulating emphasis that the manifestations of living matter are not explicable with only the forces of dead matter," and he adds, p. 438, "The assertion that this is shown by every or by any physiological investigation is flatly contradicted by most of the investigators." On p. 439 the evidence is called for. I have selected from investigations on what in general comes under the term Osmosis (diffusion, absorption, transudation, etc.), a few references to recent work. This branch of physiology has been chosen for it is in this that the stronghold of the mechanical physiologists may be found. The questions are sharply defined also and experiments may be made on precisely the same object, both in the living and in the dead condition.

Heidenhain, R.: Versuche und Fragen zur Lehre der Lymphbildung. Arch. f. d. gesammte Physiolgie des Menschen u. der Thiere (Pflüger's Archiv.) Bd. 49, 1891, pp. 209–301. In his conclusions he says: "Da die Triebkraft nicht in dem Blutdrucke liegen kann, muss dieselbe ihren Ursprung aus den Capillarwandung selbst herleiten; es handelt sich um Secretion, nicht um Filtration."

Reid, W.: Osmosis experiments with living and dead membranes. Journal of Physiology, Vol. XI., pp. 312–351.

It is shown that the dead differed markedly from the live membranes. With the living membranes the osmosis is more like the secretion of a gland.

Starling, E. A. and Tubby, A. H.: On absorption from and secretion into serous cavities. Journal of Physiology, Vol. XVI., 1894, pp, 140-155. "Absorption from or secretion into the pleural cavities is not a mere question of osmosis." Conclusions, p. 151.

Chittenden, R. H.: On digestive proteolysis, being the Cartwright lectures for 1894. New Haven, 1895, p. 116. "The view once held, that the rate of absorption from the alimentary tract stands in close relation to the diffusibility of the products formed, and that non-diffusible substances are incapable of absorption, is no longer tenable. Absorption from the intestine is to be considered rather as a process involving the vital activity of the epithelial cells of the intestinal mucous membrane, where chemical affinities and other like factors play an important part in determining the rate and order of transference through the intestinal walls into the blood and lymph."

Howell, W. H.: The Physiology of Secretion. The Reference Handbook of the Medical Sciences, Vol. VI., pp. 363–379. "If the living lung tissue that allowed no liquid to filter through it was killed by heat or any other means, filtration quickly commenced. Similar results were obtained with the frog's intestines and abdominal wall; and if we were justified in applying these results to the other membranes of the body, it would be necessary to explain transudations by something more than simple physical laws." * * * After speaking of some other facts he continues: "Investigations like this compel us to be cautious in explaining the simplest phenomenon of the animal body by physical laws obtained by the study of dead matter."

In the experiments the structure remains the same, and consequently if the results differ the difference cannot be deduced from structure, for the only difference, so far as can be determined, is that it is alive during one experiment and dead at another. If it is urged that the difference is still due to structure which is different in the dead membrane, then life made the difference and there is no ground for disagreement.

In preparing the address it was supposed that a moderate amount of scientific restraint was exercised, and among other qualifications it is stated in the paragraph preceding the one quoted by the critic that, "In brief, it seems to me that the present state of physical and physiological knowledge warrants the assumption, the working hypothesis, that life is a form of energy different from those considered in the domain of physics and chemistry. . . . It, like the other forms of energy, requires a ma-

terial vehicle through which to act. . . . Like the other energies of nature, it does not act alone, etc."

The critic says, p. 439: "Recent utterances seem to show that all the criminals are not among the materialists, and that the dogmatism of biologists must be attacked at both ends of the line."

"In all seriousness we ask, what can fundamental disagreement among those who speak with authority lead to except disaster? Are we not bound to find first principles which will command the assent of all thinking men?"

I supposed it was an axiomatic truth that to have agreement only one man must do the thinking. However, progress has not been most rapid under such circumstances in the past. Perhaps, after all, the best possible antidote to the whole criticism of *Science or Poetry* is the review of Haeckel's Monism, entitled 'The tyranny of the monistic creed' (SCIENCE, N. S., Vol. I., p. 382). There seems in this review to be a protest against any one man setting up as the sole possessor of true doctrine. Here is one sentence from the review: "He (Haeckel) tells us all eminent and unprejudiced men of science who have the courage of their opinions think as he does." As the reviewer did not take kindly to this tyranny of monism, perhaps Haeckel would not include him among the elect in science, but rather would count him also among the poets.

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THE KATYDID'S ORCHESTRA.

TO THE EDITOR OF SCIENCE: The letter in the September 20th issue, from Mr. George M. Gould, seems to indicate that there is considerable ignorance concerning what are supposed to be elementary facts in entomology; and further, that the letter was not submitted to Mr. Scudder, the Entomological Editor, who is well posted in this matter. Mr. Gould asks, "Is Company A composed of males and Company B of females?" The solution suggested is an impossible one, because throughout the *Orthoptera* the females are mute and only the males are provided with stridulating organs. Furthermore, in speaking of the 'Katydid,' Mr. Gould seems not to be aware that we have at least a dozen species to which this name is applied. We have *the* 'Katydid' which is *Cyrtophyllum concavum*, which is most generally described, and which makes the typical 'Ka-ty-did' or 'Ka-ty-did'-nt' sound. This species, I believe, does not occur in North Carolina, and the insect to whose sound Mr. Gould has listened was quite a different species from the one that makes loud music in the Middle and Eastern States. The members of the genera *Microcentrum*, *Scudderia* and *Amblycorypha* are all 'Katydids,' all musicians, and each species has a different note. Some of the sounds made by the Locustidæ have been described and set to music by Mr. Scudder, and as a matter of fact every collector in this order soon learns to know, with a fair degree of certainty, exactly what species is making the sound. Mr. Gould's observations are interesting; but they will have very little value until we know of what species he speaks. It is quite certain that the true 'Katydid' is not the species intended.

JOHN B. SMITH.

RUTGERS COLLEGE, NEW BRUNSWICK, N. J.,
October 14, 1895.

Professor Smith is of course correct in taking Dr. Gould to task for suggesting that the female katydid may stridulate, but it is not by any means so sure that Cyrtophyllus (the true katydid) 'does not occur in North Carolina,' as believed by him; on the contrary it is at least highly probable that it does, for it is not only found 'in the middle and eastern States,' as he says, but has also been reported from Kentucky (Garman), South Carolina (Saussure) and Georgia (Brunner), as well as in the West from Illinois to Texas. Professor Smith speaks as if the other genera he mentions (which are *erroneously* called katydids) belonged in the same group with Cyrtophyllus, whereas the last belongs to a different family (Pseudophyllidæ) and is indeed interesting as the only genus of that family yet known in the United States, although the family is richly represented in Central and especially South America.

The antiphonal rhythm of the two 'orchestras' mentioned by Dr. Gould is very interesting and not altogether unlike what has been observed among crickets; but I am inclined to doubt the